

ATTACHMENT 1

STATEMENT OF WORK INCANDESCENT LAMP, PAR-56

July 27, 2011

**STATEMENT OF WORK
Q20A/PAR-56/C INCANDESCENT LAMP
TYPE I, MOGUL END PRONG, 500W
NSN 6240-01-217-0894
(The Supply Contractor & FAALC)**

1.0. Scope

The contractor shall manufacture and provide the Type I, 500 Watt, PAR-56, Q20A/PAR56/C - see Table I page 9 of Specification FAA-E-2408b, date July 31, 2000)

2.0. Purpose

To define workmanship criteria, testing requirements and high level test methods to be followed by offerer's testing of product. It provides the basis of understanding between any offerer and FAALC regarding product and testing.

3.0. Reference Documents

FAA-E-2408b SPECIFICATION, dated July 31, 2000
FAAD-STD-013

4.0 Requirements: See Specification FAA-E-2408 b

4.1 – Test and inspection of production models: see Part 4 of the Specification FAA-E-2408b.

Any failure of the lamp to meet the requirements in this S.O.W, in the specification FAA-E-2408b shall be cause for rejection.

4.1.2 – Inspection Data and samples to be delivered: The contractor shall prepare and submit a list of test procedures, certified laboratory test results as specified in 4.3 of this S.O.W to the Contracting Officer and the five tested units for evaluation. In addition, the following ***specification requirements*** will be checked on a pass/fail basis forms:

Section 3.4 Lamp parameters and performance and dimension:
Lamp shall conform to the requirements of Table I. Filament coil shall not wiggle or swing during operation, thereby shorting out turns reducing lamp filament resistance and Lamp Dimensions, the lamp

shall meet the dimensions and tolerances specified in Figure 1 or figure 2 as applicable to the lamp type.

Section 3.6.1 Fungus Proof Materials

Section 3.6.2 Metals

Section 3.6.4 Mogul End Prong and Screw Terminals

Section 3.7 Marking

4.2 – Test and inspection of production units: see part 4 of the Specification FAA-E-2408b.

In addition the following *specification requirements* will be checked on a pass/fail basis forms:

Section 3.4 Lamp parameters and performance and dimension:

Lamp shall conform to the requirements of Table I. Filament coil shall not wiggle or swing during operation, thereby shorting out turns reducing lamp filament resistance and Lamp Dimensions, the lamp shall meet the dimensions and tolerances specified in Figure 1 or figure 2 as applicable to the lamp type.

Section 3.6.1 Fungus Proof Materials

Section 3.6.2 Metals

Section 3.6.4 Mogul End Prong and Screw Terminals

Section 3.7 Marking

Section 5.2: Individual Packing

The FAA will audit the contractor's records. The audit may include witnessing the manufacturing process.

4.3 Test Data

The contractor shall prepare and submit a list of tests, acceptance test procedures and test data forms to the Contracting Office to be reviewed before the testing. The heading of the test data forms shall show the item name, national stock number (NSN), FAA type designation or manufacturer's part number, serial number, and contract number. The body of the test data form shall indicate for each test the description, requirement and results.

5 – Preparation for Delivery: See part 5 of specification FAA-E-2408b

Each and every lot shipped to the FAA will include the Certificate of Conformance for that lot. A duplicate Certificate will be mailed or electronically transmitted to the Contracting Officer's Technical Representative (COTR) assigned to monitor the acquisition. The Contracting Officer issuing the formal documents for the acquisition will identify the COTR in the formal documents.

A responsible employee of the contractor shall sign all Certificates of Conformance. The contractor shall furnish a current list of authorized individuals to the FAA Contracting Officer. The certificates of conformance shall identify the number of lamps, identified by their date of manufacture and ordering designation, in each lot shipment.

6- Note

In the specification FAA-E-2408b

a- Page 11, Part 4.5 Test methods: change "the system" to "the lamp units"

b- Page 16, Part 6.2 Government furnish equipment.- Delete entire paragraph "It isfurnish equipment" and replace with "None".

ATTACHMENT 2

FAA STANDARD

FAA-E-2408b

INCANDESCENT LAMP, PAR-56



U.S. Department Of Transportation

**Federal Aviation Administration
Specification**

LAMPS, PAR-56 Incandescent
AVIATION SERVICE

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1. SCOPE

1.1 Scope. - This specification covers halogen-cycle PAR-56 incandescent aviation service lamps or equivalent used for runway approach lighting systems.

1.2 Classification. - The following types of lamps are covered in this specification:

Type I	Lamp, PAR-56, Mogul End Prong
Type II	Lamp, PAR-56, Screw Terminals

2. APPLICABLE DOCUMENTS

2.1 FAA documents. - The following FAA documents of the issues in effect on date of invitation for bids or request for proposals, form a part of this specification and are applicable except as modified herein.

2.1.1 FAA specification.

FAA-E-982	PAR-56 Lampholder
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2.2 Military documents. - The following military and federal documents of the issues in effect on the date of the invitation for bids or request for proposals, form a part of this specification and are applicable to the extent specified herein.

2.2.1 Military standards.

MIL-STD-129	Marking for Shipment and Storage
MIL-STD-810F	Environmental Test Methods and Engineering Guidelines

2.3 Other standard documents. The following national standards of issues in effect on the date of the invitation for bids or request for proposals, form a part of this specification and are applicable to the extent specified herein.

ANSI/ASQC Z1.4	Sampling Procedure for Inspection by Attributes
ANSI/ASQC-Q9003-1994	Quality Systems, Model for Quality Assurance in final Inspection and Test
ASTM D 3580	Standard Test Method of Vibration (Vertical Sinusoidal Motion) Test Products.
ASTM D 3951	Standard Practice for Commercial Packaging
ASTM D 4169	Standard Practice for Performance Testing of Shipping Containers and Systems
ASTM D 5112	Standard Practice for Testing of Shipping Containers and Systems.

(Copies of this specification and other applicable FAA specifications may be obtained from the Contracting Officer in the office issuing the invitation-for-bids or request-for-proposals. Requests should fully identify material desired, i.e., specification and amendment. Requests should cite the invitation-for-bids, request-for-proposals, or the contract involved, or the use to be made of the requested material.)

(Mail requests for copies of military standards, to DODSSP Customer Services, Standardization Documents Order Desk, 700 Robbins Avenue, building 4D, Philadelphia, PA 19111-5094.)

(ASTM documents may be obtained from American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

(ANSI/ASQC documents may be obtained from ASQC, 611 East Wisconsin Avenue, Milwaukee, Wisconsin 53202

2.4 Precedence.- In case of conflict between this specification and specifications and standards referenced in 2.1.1, 2.2.1, and 2.3, this specification shall govern.

3. REQUIREMENTS

3.1 General.- The lamps covered by this specification are to be used for outdoor operation. All lamps shall have halogen-cycle quartz filament tubes or equivalent sealed in a PAR-56 envelope, consisting of internally coated reflector and a cover glass, as shown in figures 1 and 2. Lamps may be coated with an environmentally protective coating. The coating shall be permanently attached to the lamp. There shall be no air bubbles between the coating and the lens of the lamp. The coating shall retain ninety five percent of the initial visible light transmittance after two years of operation with exposure to sunlight. Lamps with the mogul end prongs (figure 1) shall be for installation in above-ground lamp holders, and lamps with the screw terminals (figure 2) shall be used for installation below the surface in semi-flush approach lighting fixtures. All further references to lamps in 3.2 through 6.1 hereafter, refer to coated lamps and uncoated lamps as described in this section.

Type I lamps are mounted in FAA lamp holders installed in the approach area and on the extended centerline of an airport runway.

Type II lamps are installed in semi-flush light fixtures in the approach area and on the extended centerline of an airport runway, typically as shown in Figure 3.

3.2 Functional requirements.- The lamps, mounted in their lamp holders, normally will be installed in the approach areas to runways extending from the landing threshold outward. The lamps shall function in their lamp holders in continuous or intermittent outdoor service under the environmental conditions specified in 3.5.

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FAA-E-2408a dated October 7, 1987

3.3 Equipment to be furnished by the contractor.- The contractor shall furnish PAR-56 lamps, meeting all requirements of this specification, in quantities specified in the contract schedule. The lamps shall be identified by their rated wattage, rated current, month and with year manufactured, and by their ordering designations.

3.4 Lamp parameters and performance requirements.- Lamps shall conform to the requirements of Table I or Table II. Filament coils shall not wiggle or swing during operation, thereby shorting out turns and reducing lamp filament resistance (4.5.2 and 4.5.4).

3.4.1 Wattage rating.- The lamp operating at rated current shall meet the wattage rating shown in Table I or Table II, after being burned-in for a period equal to 1 percent of its average life at an ambient temperature of 68 degrees Fahrenheit \pm 20 degrees Fahrenheit (20 degrees Celsius \pm 11 degrees Celsius) (4.5.1).

3.4.2 Life.- The life of a constant current lamp is identified as the number of hours of usage at rated current until failure, or the voltage across the lamp increases by six percent, or until the light output falls below 80 percent of the specified initial light output (4.5.3). The lamp initial light output is the photometric values measured during the Photometric test 4.5.4.

3.4.3 Light maintenance.- The lamp light output at rated life shall be greater than or equal to 80 percent of the initial light output (4.5.5) and (4.5.14).

3.5 Environmental requirements.- The lamps, mounted in standard FAA PAR-56 lamp holders conforming to specification FAA-E-982, shall be designed for outdoor installation and continuous or intermittent operation in driving rain, sleet and snow, and under the following environmental conditions.

3.5.1 Temperature.- Any temperature between -67° F (-55° C) and +158° F (+70° C) (4.5.7).

3.5.2 Low pressure altitude.- Any altitude from sea level to 10,000 feet (3,048 meters) above sea level (4.5.10).

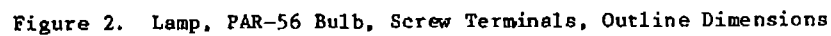
3.5.3 Humidity.- Any relative humidity between 10 and 100 percent over the temperature range specified in 3.5.1 (4.5.9).

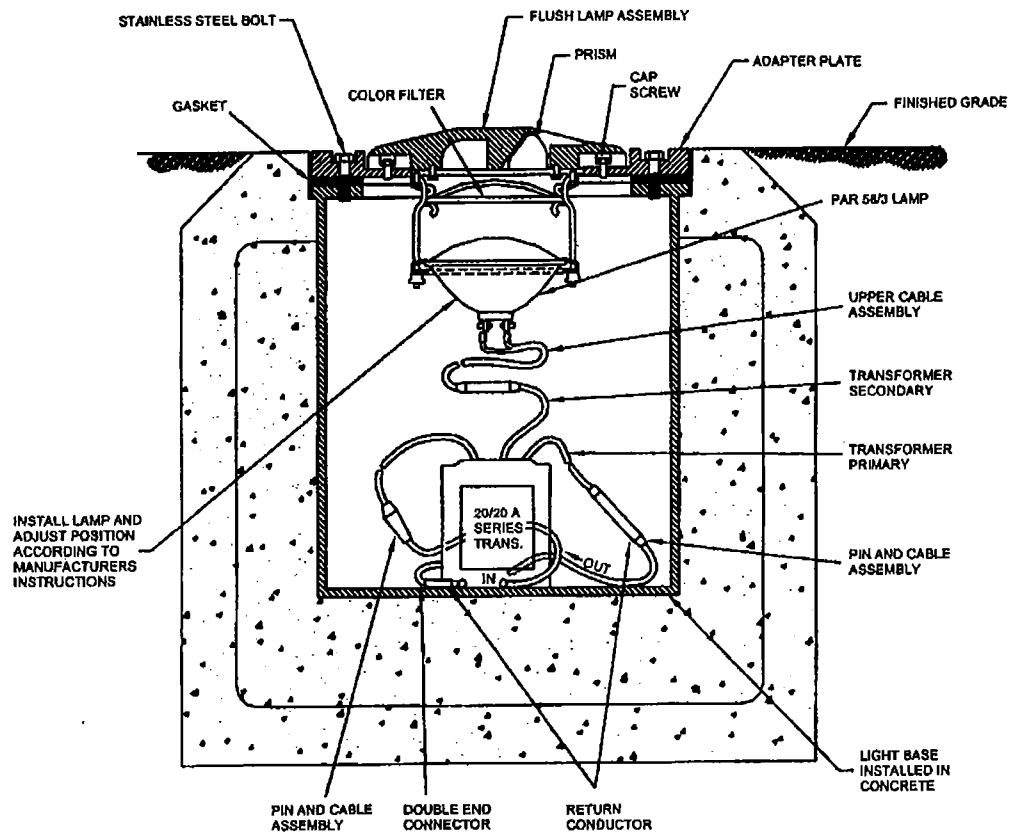
3.5.4 Salt fog.- Exposure to salt laden atmosphere (4.5.11).

3.5.5 Rain.- Exposure to wind-blown rain (4.5.12). Applicable only to type I lamps.

3.5.6 Thermal shock.- Exposure to a sudden application of cold water and ice (4.5.6 and 4.5.13).







NOTE: NOT ACCEPTABLE FOR CAT II OPERATIONS

Figure 3. Typical ALS Flush Lamp Installation

3.5.7 Vibration.- The equipment installed in a PAR-56 Lampholder, meeting FAA-E-982, shall be capable of withstanding vibrations in three planes (4.5.8) and in the frequency range of 10 to 2,000 hertz, acceleration in gravities (4.5.8.1 Table III).

3.5.8 Solar Radiation (Sunshine).- Coated lamps shall be able to withstand continuous irradiance intensity of 1120 watts per square meter. The coating shall retain a 95 percent of initial transmittance after two years of solar radiation (4.5.14).

3.5.9 Icing/freezing rain.- The lamp shall operate with one half inch (1/2") (12.7 mm) of glaze ice on the lamp (4.5.6.2). With these icing conditions the lamp shall operate without defect.

3.6 Lamp design and construction.- The lamps shall be of the halogen-cycle type suitable for use in fixtures operated at ambient temperature from -67° F (-55° C) to +158° F (+70° C). The PAR-56 lamp shall meet the dimensions specified in figure 1 or figure 2 as applicable to the lamp type.

3.6.1 Fungus-proof materials.- Whenever practicable, materials that are nutrients for fungi shall not be used. When such materials are used and not hermetically sealed, they shall be treated with a fungicide agent acceptable to the procuring activity. However, if they are used in a hermetically sealed enclosure, fungicide treatment is not necessary.

3.6.2 Metals.- Metals shall be corrosion resistant or suitably treated to resist corrosion caused by fuels, salt spray, or atmospheric conditions that may be encountered in storage or normal service on an airport.

3.6.3 Selection of materials.- Specifications and standards for all materials, parts, and government certification and approval of processes and equipment, which are not specifically designated herein and which are necessary for the execution of this specification, shall be selected and submitted for approval to the Contracting Officer, or as specified in the contract schedule.

3.6.4 Mogul end prong and screw terminals.- The mogul end prongs for type I lamps shall conform to the physical dimensions shown in figure 1. A minimum 0.430 inch flat prong surface shall be provided for attachment of a lamp connector.

Screw terminal lugs of type II lamps shall be straight and flat. Threads in the lug and on the mating screw shall be free of deformation and burrs.

3.6.5 Optional design.- Design details not specified are optional. The physical appearance of the lamp shown in figures 1 and 2 is preferred; however, minor variations will be permitted, provided

performance requirements are met, the lamp is physically interchangeable with those depicted in figures 1 and 2, and the design is approved by the procuring activity.

3.7 Marking.- Each lamp shall be marked on the back of the reflector body with the ordering designation, rated wattage, rated current, day, month and year of manufacture and the manufacturer's name, logo or trademark or CAGE code. The marking shall be permanent and remain legible for the life of the lamp. The manufacturer's name, logo, or trademark molded into the lamp may be substituted for only that portion of the marking requirement. Stick-on labels are not acceptable (4.4.1).

3.8 Workmanship.- Each lamp shall be free from blemishes and defects. Marking of parts and assemblies shall be clear, legible, and durable. Soldering, welding, brazing, cementing, and wiring shall be thorough. Alignment of parts shall be accurate. The mogul end prongs shall be straight, without bends, twists or burrs. The sealed lamp shall be free of loose internal items and debris.

3.8.1 Cleaning.- Each lamp shall be thoroughly cleaned, and loose, spattered, or excess solder, metal chips, flux, and other foreign material shall be removed during and after final assembly.

3.9 Packaging, packing and marking.- The lamp shall be packaged, packed and marked in accordance with Section 5.

4. QUALITY ASSURANCE PROVISIONS

4.1 Quality control provisions.- The contractor shall provide and maintain a quality control program that fulfills the requirements of American National Standards ANSI/ASQC-Q9003-1994. ISO certification is not required. All tests and inspections made by the contractor may be subjected to government inspection. The term "government inspection," as used in this specification, means that an FAA representative will witness the contractor's testing and inspection, and will carry out such visual and other inspection as deemed necessary to assure compliance with contract requirements. Inspection is meant to be separate and distinct from testing and shall be limited to visual and/or observational. Operational shall mean the lamp shall light and shall not be subjected to testing. Inspecting and testing shall be conducted using test procedures prepared in accordance with ANSI/ASQC-Q9003-1994 and approved by the government. The contractor shall prepare the test procedures.

4.2 Test and inspection of production models.- The first five units of production, designated as production models, shall be subjected to the examinations specified in 4.4 and the tests specified in 4.5.1 through 4.5.14. The lamps shall be mounted in PAR-56 lamp holders and shall be operated at rated current during the conduct of tests specified in 4.5.1

Table I. Lamp Design Parameters (Mogul End Prong, Type I)

Ordering Designation	Q6.6A/PAR56/2	Q20A/PAR56/C	Q20A/PAR56/1/C
Wattage Rating	200 ± 16	300 ± 18	500 ± 30
Rated Amperes (RMS)	6.6 $\pm 0.5\%$	20 $\pm 0.5\%$	20 $\pm 0.5\%$
Average Life, Hours	1000	500	500
<u>Minimum Candela Requirements Within Beam Field</u>			
<u>Point Location (degrees from mechanical axis)</u>			
2 up - 13.5 left	10,000		
2 down - 13.5 left	10,000		
2 up - 13.5 right	10,000		
2 down - 13.5 right	10,000		
3.5 up - 13.5 left		7,000	20,000
3.5 down - 13.5 left		7,000	20,000
3.5 up - 13.5 right		7,000	20,000
3.5 down - 13.5 right		7,000	20,000
2.5 up - vertical	10,000		
2.5 down - vertical	10,000		
4 up - vertical		16,000	20,000
4 down - vertical		16,000	20,000
horizontal - 10 left		16,000	
horizontal - 10 right		16,000	
horizontal - 14 left	10,000	7,000	20,000
horizontal - 14 right	10,000	7,000	20,000
Maximum Intensity, Candela (not to be exceeded in any direction)	25,000	48,000	55,000
Cover Glass	Prismatic	Prismatic	Prismatic
Base	All three (3) lamps - Mogul End Prong		
Burning Position	All three (3) lamps - Horizontal to 25° Base Down		

Table II. Lamp Design Parameters (Screw Terminals, Type II)

Ordering Designation	Q20A/PAR56/2	Q20A/PAR56/3
Wattage Rating	300 ± 18	503 ± 30
Rated Amperes (RMS)	20 $\pm 0.5\%$	20 $\pm 0.5\%$
Average Life, (hours)	500	500
<u>Minimum Candela Requirements Within Beam Field</u>		
<u>Point Location (degrees from mechanical axis)</u>		
1.5 up - vertical	87,500	180,000
1.5 down - vertical	87,500	180,000
horizontal - 3 left	87,500	
horizontal - 3 right	87,500	
horizontal - 2 left		180,000
horizontal - 2 right		180,000
Minimum Peak Intensity (Candela)	175,000	300,000
Cover Glass	clear	clear
Base	Screw Terminal	Screw Terminal
Burning Position	Horizontal to Base Down	Horizontal to Base Down

through 4.5.14. The humidity test (4.5.9) shall precede the thermal shock test (4.5.6), and both tests shall be conducted on the production models.

4.3 Test and inspection of production units.- Testing of the production unit shall start after acceptance of the production models. All of the production units shall be examined as specified in 4.4 and tested as described in 4.5.1, 4.5.2, 4.5.4, and 4.5.13. During inspection after production tests, if 10 percent of the preselected number of production

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units fail the test, as specified in 4.3.2, then all production units shall be retested. Any cracking, fading, or failure of the lamps to operate shall be cause for rejection.

4.3.1 Inspection data.- The contractor shall prepare and submit a list of tests, acceptance test procedures, and test data forms to the Contracting Officer.

4.3.2 Acceptance inspection.- Acceptance shall be made on a sampling basis in accordance with ANSI/ASQCZ1.4-1993, using Special Inspection Level S-3, AQL 4.0 and a single sampling plan for normal inspection as per Table II-A page 11.

4.4 Examinations

4.4.1 Examination of product.- The lamp shall be inspected to determine compliance with the requirements specified herein with respect to materials, workmanship, and marking. The lamp shall be inspected to determine that outline dimensions meet the dimensions given in Figure 1 and Figure 2 as applicable. Lamp prongs shall be flat, any curvature in design shall be cause for rejection.

4.4.2 Preparation for delivery.- The preservation, packaging, packing, and marking shall be examined for conformance to 5.

4.5 Test methods.- Testing of the system shall be performed as follows:

4.5.1 Wattage rating test.- Prior to the wattage rating test all lamps to be tested shall be burned-in as specified in 3.4.1. The production model lamp shall be tested at the end of burn-in and prior to turn off to verify that the lamp wattage rating is within the range specified in 3.4. The production unit lamps, after being burned-in, shall be energized for 10 minutes, then while energized tested to verify that the lamp wattage rating is within the range specified in 3.4. The wattage rating shall be measured as follows: Operate the lamp as specified in 3.4.1 at full rated current ± 0.05 Amps and measure the voltage directly at the lamp prongs with a true RMS voltmeter. Rating is then calculated using $P(\text{Watts}) = V(\text{Volts}) \times I(\text{Amperes})$. The type of or use of a lamp holder during this test is at the discretion of the contractor.

4.5.2 Filament motion and shorting of turns test.- Measure the voltage across the lamp during the conduct of the life test (4.5.3) and the 2-hour test (4.5.13) to verify that no voltage step change occurs after the lamp has been energized. With a constant current input into the lamp terminals, any step change of ± 0.5 volts observed across the lamp terminals by the voltage measuring equipment shall be cause for rejection. The voltage measurement shall be recorded at 15, 30, 60, and subsequently at 120-minute intervals using the technique describe in 4.5.1.

4.5.3 Life test.- The lamp shall be tested and results of the test verified to determine that the life of the lamp conforms to the life requirements specified in 3.4.2, when the lamp is operating in a PAR-56 Lamp holder on an open, vibration-free rack.

4.5.4 Photometric tests.- Photometric tests shall be conducted to demonstrate compliance with the intensity and beam dimension requirements of Table I or Table II, as applicable. A photometric range shall be 30 feet or greater. The lamp shall be measured for rating and photometric output simultaneously with a minimum 2.5 minutes and maximum of 3.5 minutes burn time. Light output for photometry and light maintenance will be simultaneous.

4.5.5 Light maintenance test.- The lamps shall be tested to determine that at rated life, the light output shall not fall below 80 percent of the specified initial output or until the voltage drop across the lamp falls below 6 percent of the initial voltage or fails to light. Unless otherwise specified, beam lumens or total lumens, depending upon the type of lamp being tested, may be used as a criterion of light output. However, the test procedure for determining the change in light output before and after burning shall be the same for any one lamp.

4.5.6 Thermal shock tests.- Thermal shock tests shall be conducted on the lamps as specified in the subparagraphs below. At the completion of each test, the lamps shall be thoroughly examined for defects. The lamps are of acceptable quality if the reflector coating does not peel, discolor, crack, or fade; the glass does not crack or break; the cover glass does not leak or separate from the reflector body; and the terminal seals and solder joints on the terminals do not break.

4.5.6.1 Cold water test (lamps in table I only).- The lamp shall be mounted in a standard FAA PAR-56 lamp holder, fitted with a green filter (use green filter only with 500W lamp), with its longitudinal mechanical axes tilted 25° upward, and operated with rated current in a +100° F (38° C) environment until the glass temperature stabilizes for (1) minute. The lamp shall then be sprayed with water having a temperature of +40° F (+4.4° C), from a nozzle at 45° to the mechanical axis of the lamp (20° from vertical) such that the spray impinges upon the front cover glass. The water spray shall simulate a rainfall of 4 inches (10.16 cm) per hour with the size of droplets not less than 2 millimeters. The spray shall be maintained for at least 15 minutes. At the conclusion of the test, the lamp shall be de-energized, removed from its environment, and examined for defects. In addition, when there is a coating on the lens cover, cut a one inch square into the surface coating, adhesive tape, commercial item A-A-883 (NSN 7510-010031-3129) shall be placed over the square on the surface of the lens and removed after five minutes. The adhesive tape shall be of sufficient length to allow removal with the removing force applied at right angles to the surface. Any peeling of the lens protective coating, from the area under the tape, or visible anywhere on the lens surface, shall constitute failure of the test.

4.5.6.2 Icing test. - This test shall be performed on both type I and type II lamps. The icing test shall be conducted in accordance with Procedure I, Method 521.2 of MIL-STD-810F. The lamp shall be placed in an environment of $+23^{\circ}\text{F} \pm 2^{\circ}\text{F}$, ($-5^{\circ}\text{C} \pm 1.1^{\circ}\text{C}$) until cooled to this temperature. Water shall then be introduced by suitable means to cause a layer of ice to form on the lamp covering, the reflector and the cover lens to a thickness of at least 1/2 inch (12.7mm). After the required thickness of ice has formed, the lamp shall be retained in the $+23^{\circ}\text{F}$ (-5°C) environment for an additional period of at least 30 minutes. With the longitudinal axis of the lamp tilted 25° upward, the lamp shall then be energized with rated current and allowed to operate until the ice melts and breaks free. The lamp shall be de-energized, removed from its environment, and examined for defects. In addition, when there is a coating on the lens cover, adhesive tape, commercial item A-A-883 (NSN 7510-010031-3129) shall be placed on the surface (center) of the lens and removed after five minutes. The adhesive tape shall be of sufficient length to allow removal with the removing force applied at right angles to the surface. Any peeling of the lens protective coating, from the area under the tape, or visible anywhere on the lens surface, shall constitute failure of the test.

4.5.7 Temperature Tests.

4.5.7.1 High temperature. - The high temperature test shall be conducted in accordance with Procedure II, Method 501.4, extreme induced conditions, of MIL-STD-810F, except the temperature shall be constant, 158°F ($+70^{\circ}\text{C}$), and maintained for a period of 6 hours minimum duration. The temperature sensors shall be installed around the production model in the test chamber. This test shall be run concurrently with the low temperature and pressure tests.

4.5.7.2 Low temperature. - The low temperature test shall be conducted in accordance with Procedure II, Method 502.4 of MIL-STD-810F. The temperature shall be constant. The type I lamps shall be tested at -67°F (-55°C) and maintained for a period of 6 hours minimum duration. The type II lamps shall be tested at -40°F (-40°C). The test chamber temperature shall be maintained for a period of six hours prior to energizing the lamp. The temperature sensors shall be installed around the production model in the test chamber. This test shall be run concurrently with the high temperature and pressure tests.

4.5.8 Vibration test. - The PAR-56 lamp shall be installed and operating at rated amperes in a standard FAA PAR-56 lamp holder and the assembly shall be vibrated in the following three planes:

- (a) A plane perpendicular to the vibration table (vertically)
- (b) A plane parallel to the light beam axis (horizontally)
- (c) A plane horizontally at right angles to the light beam axis (side)

4.5.8.1 Vibration levels.- The vibration levels are shown in Table III. The duration of each sweep shall be 10 minutes. A sweep is the vibration of a unit throughout a given frequency range. At the conclusion of the test the lamp shall be thoroughly examined. Failure of the lamp to operate during the test, and any mechanical failure observed on the lamp after the test shall be cause for rejection.

Table III. Vibration Test Data

Acceleration in Gravities	Frequency, Hertz
0.020 inch double amplitude (displacement)	10-70
1	70-200
1	200-500
1	500-2,000

4.5.9 Humidity test.- The humidity test shall be in accordance with Procedure II, Method 507.4, of MIL-STD-810F, except that a total of three complete 24 hour cycles (72 hours) shall be required (Table 507, 3-I (cycle 5)). The high temperature shall be +70°C (158°F) and the highest relative humidity shall be 100 percent instead of 75 percent.

4.5.10 Low pressure (Altitude) test.- The low pressure test shall be conducted in accordance with MIL-STD-810F, Method 500.4, Procedure II. The lamp shall be tested at atmospheric pressures corresponding to sea level and 10,000 feet (3,048 meters) altitude. The type I lamp shall be tested at both -67°F (-55°C) and +158°F (+70°). The type II lamp shall be tested at -40°F (-40°C) and +158°F (+70°). Lamps shall be tested for six cycles at rated current and power, with a power off interval. A cycle is defined as operation for one hour at rated current and power, followed by one-half hour off. This test shall be run concurrently with the low and high temperature tests.

4.5.11 Salt fog test.- The salt fog test shall be performed in accordance with Procedure I, Method 509.4, of MIL-STD-810F. The equipment shall be exposed for a period of 86 hours, consisting of four consecutive periods of twelve (12) hours wet and twelve (12) hours dry, followed by a 48-hour drying period. At the conclusion of the test, salt buildup or film may be removed with tap water.

4.5.12 Rain test.- The rain test shall be performed in accordance with Procedure I, Method 506.4, of MIL-STD-810F. The wind velocity shall be 18 m/s (40 mph), and the rainfall rate shall be 10cm/h (4in/h). The test item temperature shall be at least 10° ± 3°C (50° ± 37° F) higher than the rain temperature at the beginning.

4.5.13 Two-hour test. - Production units selected in accordance with paragraph 4.3.2 shall be tested. Production model and production units shall be mounted in standard FAA PAR-56 lamp holders (green filters are required on 500 watt lamps only) and operated for 2 hours at rated current and ambient temperature of $86^{\circ}\text{F} \pm 18^{\circ}\text{F}$ ($30^{\circ}\text{C} \pm 10^{\circ}\text{C}$). After one hour of continuous operation, the lamps shall be subjected to the test described in 4.5.6.1, except that the water spray shall be maintained for five seconds, and repeated every 15 minutes.

4.5.14 Solar Radiation (Sunshine) test. - The solar radiation (sunshine) test shall be performed in accordance with Procedure II, Method 505.4, of MIL-STD-810F. An irradiance intensity of 1120 watts per square meter shall be applied to the lamp coating for six hundred and thirty days. At the end of the test the lamp coating transmittance shall be ninety five percent of the initial transmittance, and the lamp at rated life shall meet the eighty percent light maintenance requirement (3.4.3).

4.6 Test performance. - All tests described above shall be performed by the contractor, at the contractor's facility, or at a FAA approved independent testing laboratory. A FAA representative may witness tests. Tests shall be conducted on the production model and on production units as outlined above to provide compliance with this specification.

5. PREPARATION FOR DELIVERY

5.1 General. - Lamps shall be packaged for extended warehouse storage and reshipment. Packaging shall be in accordance with ASTM D 3951 and testing or validation shall be in accordance with ASTM D 4169, Assurance level II, Distribution cycles 18.

5.2 Packaging. - Each lamp, with one inch cushioning, shall be packaged in an individual unit package fiberboard container. Unit packages shall be over packed in intermediate containers with 12 unit packages per container. Intermediate packaging and shipping containers shall be capable of multiple handling and storage under favorable conditions, such as enclosed facilities, for a minimum of one year.

5.3 Palletized shipments. - All palletized shipments shall be made on disposable pallets with maximum outside dimensions of forty seven and one-half inches ($47 \frac{1}{2}$ inches) by forty inches (40 inches). Overall height of the pallet and contents shall not exceed forty seven inches (47 inches). Fork entry of the pallet shall be on the long sides of the pallet. No portion of the load shall overhang or extend beyond any pallet edge. Shrink wrapping to secure intermediate containers is encouraged.

5.4 Marking. - Unit and intermediate packages and exterior shipping containers shall be marked in accordance with MIL-STD-129, M, 4.2.1. Bar code is required and shall be in accordance with MIL-STD-129L, appendix H, 20.1, 20.7, 20.8, 20.9 and 20.10. Each intermediate package and each shipping container shall be durably marked with the following information: (example in parentheses)

Bar Code
National Stock Number:
Cage Code or Manufacturer's Part Number:
Item Description: (PAR-56 Lamp, Watts, Amperes)
Specification:
Quantity and Unit of Issue:
Contract/Purchase Order Number:
Level of Protection and Date Packed:
Manufacturer's Name and Trade Mark:

6. NOTES. The contents of the subparagraphs below are only for the information of the Contracting Officer. They are not contract requirements, and are not binding on either the Government or the contractor except to the extent that they may be specified elsewhere in the contract as such. Any reliance placed by the contractor on the information is wholly at the contractor's own risk.

6.1 Acceptance inspection. - The contract should identify the location of the final acceptance inspection as origin or destination. The Contract shall provide final acceptance inspection requirements.

6.2 Government furnished equipment. - It is recommended that the contract include PAR-56 lamp holders and green filters as needed, to be provided as government furnished equipment.

6.3 Test results. - It is recommended that for coated lamps the bidder be required to submit with the bid the test results proving that the lamp meets the requirements of the specification (3.1), (3.5.8) and (4.5.14).

ATTACHMENT 3

FIRST ARTICLE TESTING REQUIREMENTS

FIRST ARTICLE TEST (FAT) REQUIREMENTS

NSN 6240-01-217-0894

We, the undersigned, have determined that the use of first article testing is required. This decision was made only after considering the impact on cost, time of delivery, risk to the Government for foregoing such test, and the availability of other, less costly methods of ensuring the desired quality.

Signature Item Manager: _____ Signature Engineer: _____

1.a ENGINEER: TRUNG V. NGUYEN	ROUTING SYMBOL: AML-7080	DATE: 04/06/12	PHONE NUMBER: 954-4454
1.b ITEM MANAGER: Karen Lafferty	ROUTING SYMBOL: AML-7070	DATE 4/6/12	PHONE NUMBER: 954-5616
2. P/R NUMBER: PAR-56 flashtube lamp, 500W	3. PART NUMBER(S): Q20A-PAR56-1	4. NSN: 6240-01-217-0894	
5. Number of First Articles to be subject testing. (fill in quantity) <u>SEE S.O.W: 5</u> each.	6. OF LINE ITEM NUMBER	7. AND WILL BE <input checked="" type="checkbox"/> Part of Production Quantity (will not be destroyed in testing) <input type="checkbox"/> In addition to Production Quantity (will be destroyed in testing)	
8. FIRST ARTICLE TESTING <input checked="" type="checkbox"/> WILL BE GOVERNMENT TESTING or <input type="checkbox"/> WILL BE CONTRACTOR TESTING. (if Government testing, complete this page, if Contractor, complete second page of this form.)			
BLOCK 9. FIRST ARTICLE GOVERNMENT TESTING			
9a. GOVERNMENT TESTING of FIRST ARTICLE <input type="checkbox"/> Will be destroyed in test <input checked="" type="checkbox"/> Will not be destroyed	9b. FIRST ARTICLE <input type="checkbox"/> Will serve as the manufacturing standard <input checked="" type="checkbox"/> Will not serve as the manufacturing standard	9c. WAIVER of FAT Requirement <input checked="" type="checkbox"/> NO-FAT will not be waived <input type="checkbox"/> YES-FAT can be waived if contractor has provided in the past (LAST CONTRACT ONLY). Engineer must approve.	
9d. FIRST ARTICLE GOVERNMENT TESTING. The First Article must meet or exceed the following performance or other characteristics in order to be approved. 1. Testing IAW Specification <u>See Statement of Work (S.O.W) and attachments. Along with providing 5</u> samples to AML for testing, the contractor must provide AML with documentation to show that the vendor has done its own testing and that the lamps meet all the requirements that are listed in the S.O.W and Specifications. The 5 samples will be delivered with all of the vendor's test results to AML for us to test. When we do our serviceability test, it should then pass the test requirements in the S.O.W and Specification.			
Form, Fit and Function in accordance with <u>See S.O.W. and Specifications.</u>			
9e. FIRST ARTICLE DELIVERY 1. First Article is due <u>45</u> Calendar days from date of contract. 2. Contractor shall notify Contracting Officer (CO) 15 days before shipment. 3. Government has <u>30</u> Days after receipt of First Article for test and review to issue written notice of approval/disapproval of First Article. (usually 30 to 45 days) 4. Estimated cost of Government testing is <u>\$ 0 (N/A)</u>		9f. SHIPPING INSTRUCTIONS: SEE S.O.W <u>Shipping instructions to Contractor</u> SHIP TO: FAA LOGISTICS CENTER (or fill as needed) 6500 S. MacArthur Blvd. Oklahoma City, OK 73125 MARK FOR: FIRST ARTICLE/BID SAMPLE Contract No.: _____ Delivery Order #: _____ ATTENTION: AMQ- _____ Ext. _____ Name: _____	
10. SPECIAL REQUIREMENT <input checked="" type="checkbox"/> Required <input type="checkbox"/> Not Required "The first article offered must be manufactured at the facilities in which that item is to be procured under the contract, or if the first article is a component not manufactured by the contractor, such component must be manufactured at the facilities in which the component is to be produced for the contract. A certification to this effect must accompany each first article offered.			
11. DISPOSITION OF TEST SAMPLES			

- X ☐ Each approved first article will be retained by the FAA and will be accepted as part of the contract production quantity.
- ☐ Each first article will undergo destructive testing; residual components ☐ will ☐ will not be returned to the contractor.
- ☐ Approved first article shall be returned to contractor and used as the production standard, first article shall be delivered as last production unit.
- ☐ Other: _____

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FIRST ARTICLE TEST REQUIREMENTS CONTRACTOR TESTING

BLOCK 9. FIRST ARTICLE CONTRACTOR TESTING

9a. Performance or other characteristics which First Articles must meet are:
(provide list of test, procedures, data results required for approval) _____

9b. IF GOVERNMENT TESTING FIRST ARTICLE

- ☐ Will be destroyed in test
- ☐ Will not be destroyed

9c. FIRST ARTICLE

- ☐ Will serve as the manufacturing standard
- ☐ Will not serve as the manufacturing standard

9d. WAIVER of FAT Requirement

- ☐ NO-FAT will not be waived
- ☐ YES-FAT can be waived if contractor has provided in the past (LAST CONTRACT ONLY). Engineer must approve.

9e. CONTRACTOR TEST PLAN REQUIRED: SEE S.O.W

- ☐ Yes - See Block 9b.1 and complete
- ☐ No - go to Block 9f

9e. 1 PLAN FORMAT

- ☐ Government
- ☐ Contractor

9e. 2 PLAN 1ST DRAFT DUE For Engineering review and comments.

_____ Days after award, with _____ Days for Government Review, Contractor has _____ Days after receipt of Government comments to submit final draft for approval or disapproval

9e. FIRST ARTICLE TESTING

1. First Article testing shall start _____ Calendar days after award of the contract.
2. Contractor shall notify Contracting Officer (CO) 15 days before contractor to start testing.
3. First Article test report due 10 days after completion of First Article testing.
4. Government has _____ days after receipt of First Article test report for review and issue written notice of approval/disapproval of First Article. (usually 10 to 15 days)

9f. FIRST ARTICLE TEST REPORTS

Mailing instructions to Contractor
Mail to: FAA, Contract Management Branch
6500 S. MacArthur Blvd.
P.O. Box 25082
Oklahoma City, OK 73125-4929

10. SPECIAL REQUIREMENT

☐ Required

☐ Not Required

"The first article offered must be manufactured at the facilities in which that item is to be procured under the contract, or if the first article is a component not manufactured by the contractor, such component must be manufactured at the facilities in which the component is to be produced for the contract. A certification to this effect must accompany each first article offered.

11. DISPOSITION OF TEST SAMPLES

- ☐ Each approved first article will be retained by the contractor and will be accepted as production standard delivered as last production unit(s).
- ☐ Each first article will undergo destructive testing. Contractor shall keep residual until completion of the contract for reference if required.
- ☐ Approved first article shall be returned to contractor but will not be the production standard, it will be delivered as the last production unit.
- ☐ Other: _____

ATTACHMENT 4

BUSINESS DECLARATION

BUSINESS DECLARATION

- 1 Name of Firm: _____ Tax Identification No.: _____
- 2 Address of Firm: _____ DUNS No.: _____
- 3 a. Telephone Number of Firm: _____ b. Fax Number of Firm: _____
- 4 a. Name of Person Making Declaration _____
- b. Telephone Number of Person Making Declaration _____
- c. Position Held in the Company _____
- 5 Controlling Interest in Company (*"X" all appropriate boxes*)
- ☐ a. Black American ☐ b. Hispanic American ☐ c. Native American ☐ d. Asian American
- ☐ e. Other Minority (*Specify*) _____ ☐ f. Other (*Specify*) _____
- ☐ g. Female ☐ h. Male ☐ i. 8(a) Certified (*Certification letter attached*) ☐ j. Service Disabled Veteran Small Business
- 6 Is the person identified in Number 4 above, responsible for day-to-day management and policy decision making, including but not limited to financial and management decisions?
- ☐ a. Yes ☐ b. No (*If "NO," provide the name and telephone number of the person who has this authority.*) _____
- 7 Nature of Business (*Specify all services/products (NAIC)*) _____
- 8 (a) Years the firm has been in business _____ (b) No. of Employees _____
- 9 Type of Ownership: ☐ a. Sole Ownership ☐ b. Partnership
- ☐ c. Other (*Explain*) _____
- 10 Gross receipts of the firm for the last three years:
- | | | |
|-------------------------|---------------------------|---------------------------|
| | a.1. Year Ending: _____ | b.1. Gross Receipts _____ |
| a.2. Year Ending: _____ | b.2. Gross Receipts _____ | a.3. Year Ending: _____ |
| | | b.3. Gross Receipts _____ |
- 11 Is the firm a small business? ☐ a. Yes ☐ b. No
- 12 Is the firm a service disabled veteran owned small business? ☐ a. Yes ☐ b. No
- 13 Is the firm a socially and economically disadvantaged small business? ☐ a. Yes ☐ b. No

***I DECLARE THAT THE FOREGOING STATEMENTS CONCERNING _____
ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF. I AM
AWARE THAT I AM SUBJECT TO CRIMINAL PROSECUTION UNDER THE PROVISIONS OF 18 USCS 1001.***

14. a. _____ b. Date: _____
Signature _____

c. Typed _____ d. Title: _____
Name _____